No. 798,072. PATENTED AUG. 29, 1905.

W. D. QUIGLEY & J. H. GAY.

SPRING ROLL FOR LEATHER SPLITTING MACHINES.

APPLICATION FILED APR. 25, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

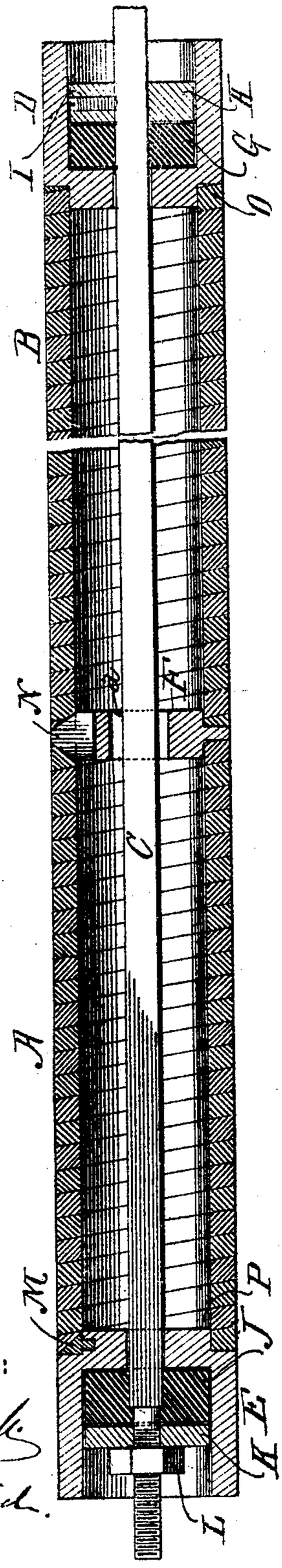

Fig. 2.

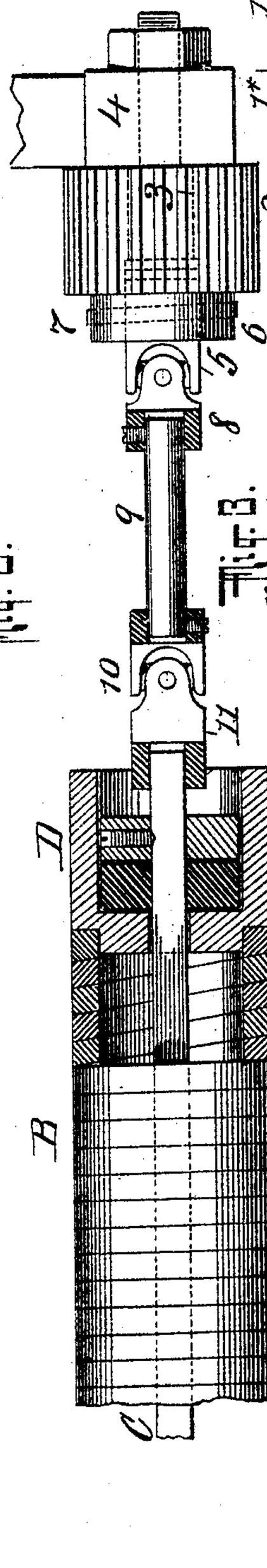

Fig. 3.

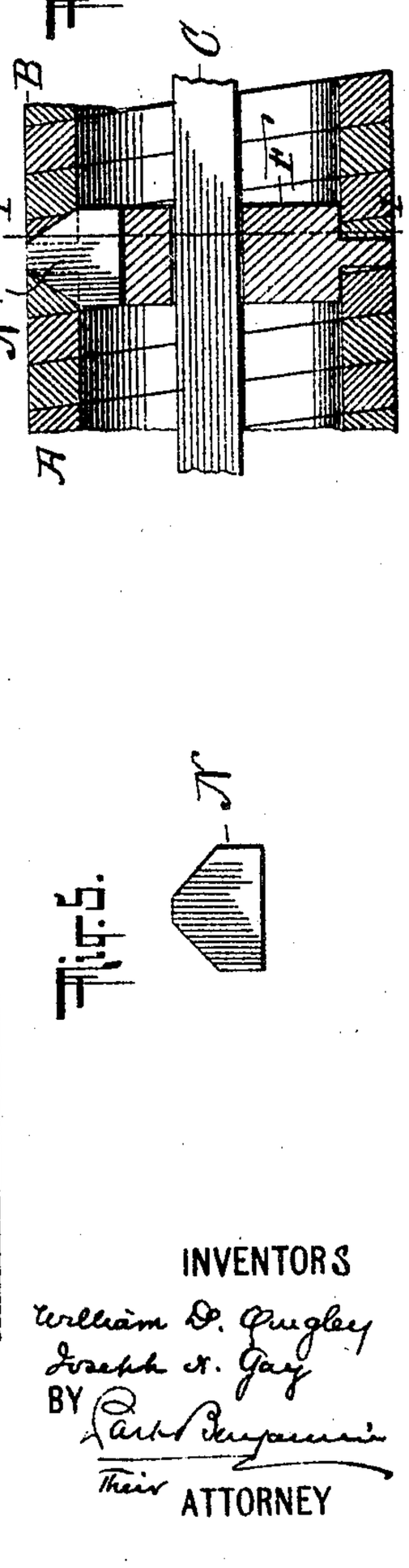

Fig. 4.

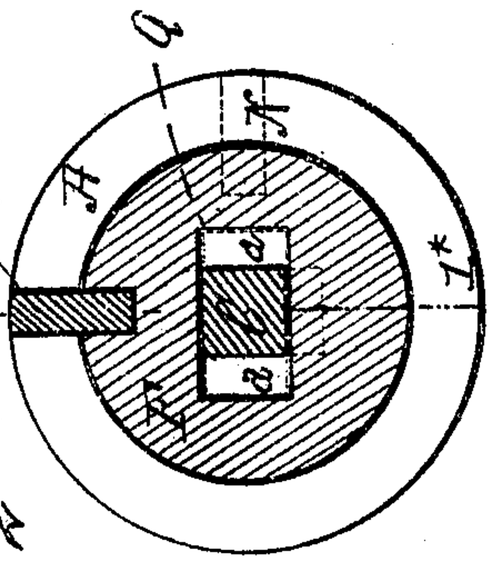

Fig. 5.

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2 SHEETS—SHEET 2.

Fig. 7.

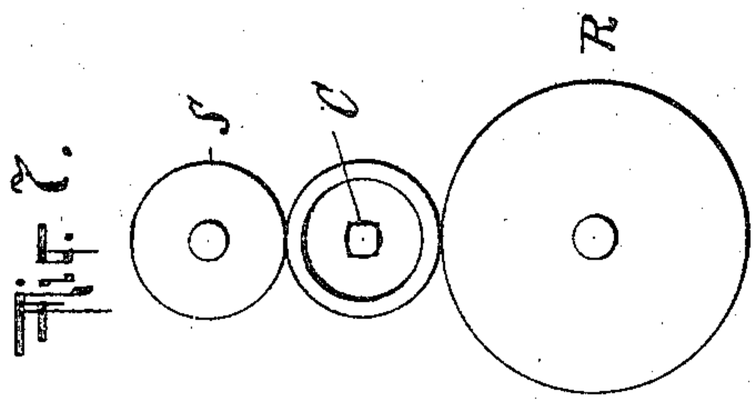


Fig. 6.

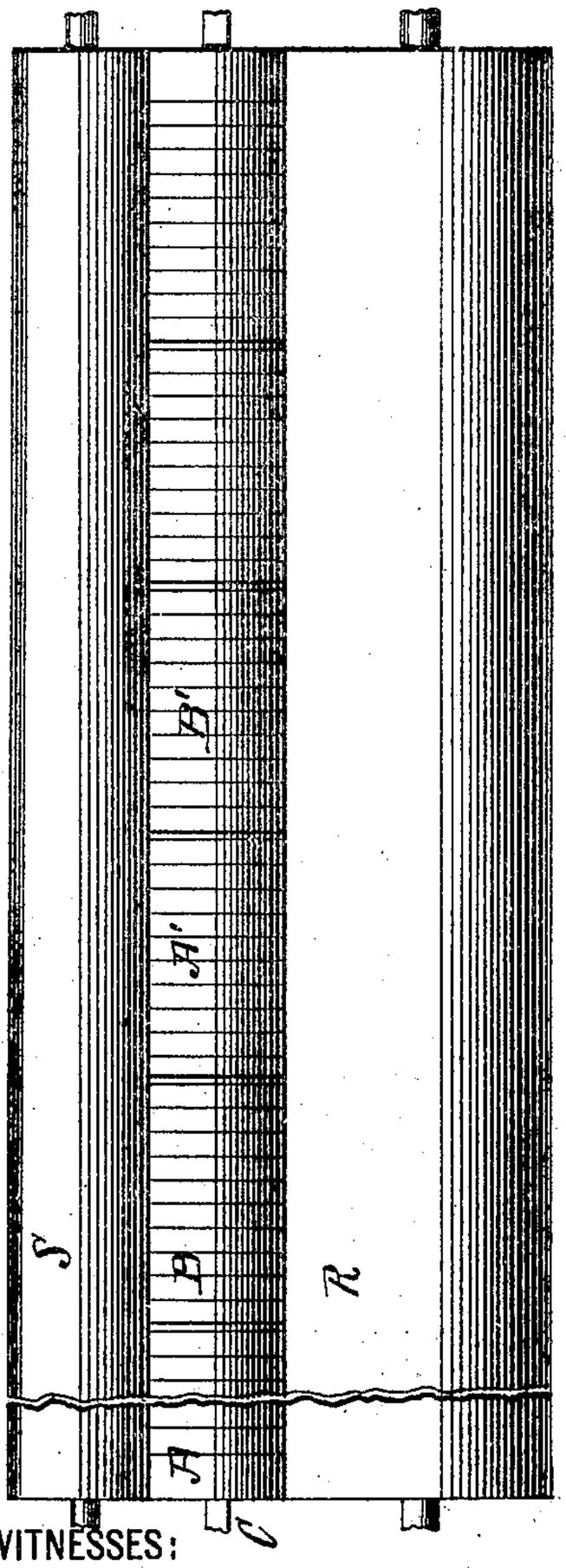
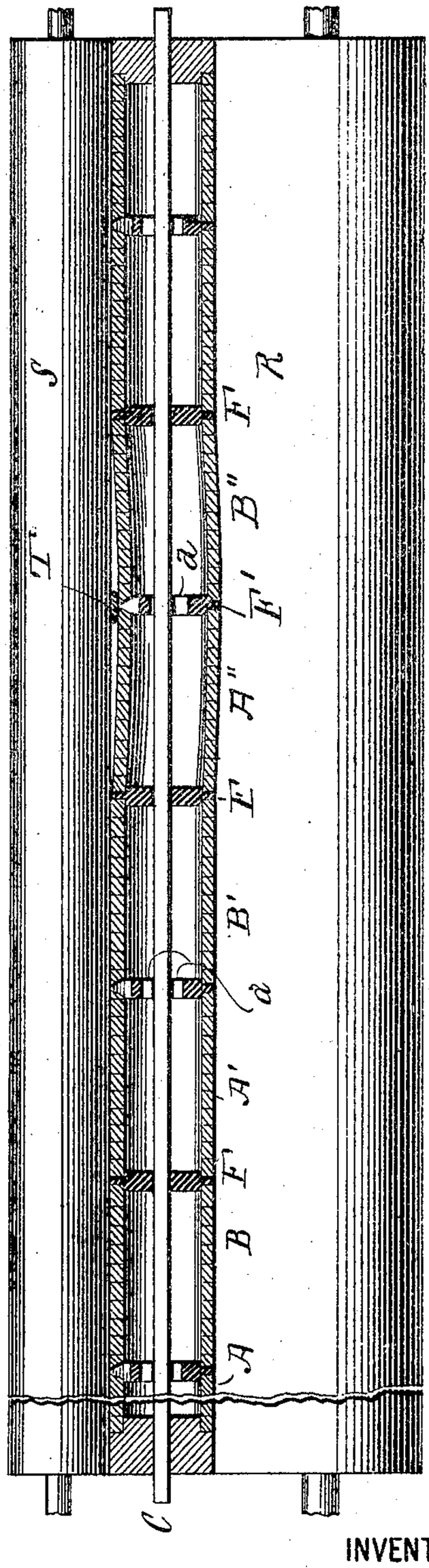


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM D. QUIGLEY AND JOSEPH H. GAY, OF NEWARK, NEW JERSEY.

SPRING-ROLL FOR LEATHER-SPLITTING MACHINES.

No. 798,072. Specification of Letters Patent. Patented Aug. 29, 1905.

Application filed April 25, 1904. Serial No. 204,867.

To all whom it may concern:

Be it known that we, WILLIAM D. QUIGLEY and JOSEPH H. GAY, of Newark, Essex county, New Jersey, have invented a new and useful Improvement in Spring-Rolls for Leather-Splitting Machines, of which the following is a specification.

In our former patent, No. 727,838, dated May 12, 1903, we have described and broadly claimed a spring-roll for leather-splitting machines formed of a close spiral, preferably of wire of rectangular cross-section, having a substantially smooth exterior surface. This spiral roll is there shown as secured upon a central rod by means of end nuts and as driven by contact with a lower driving-roll having an elastic surface. We have found that where the spring-roll is made of a single coil of wire the irregularities in the hide are apt to subject it to varying tangential strains along its length, so that the coil is apt to twist tighter in some places than in others, thus impairing the regularity of the roll-surface. Furthermore, the single-coil roll, in common with all other spring-rolls within our knowledge, cannot be properly driven by power applied to its shaft or rod, the torque, as before, being unequally resisted, resulting in uneven tightening of the coil. By our present invention we eliminate the disadvantages of the single-coil roll and at the same time produce a spring-roll which can be directly driven by power applied to the end of its central rod.

In the accompanying drawings, Figure 1 shows the spring-roll separately in longitudinal section. Fig. 2 shows the end of the spring-roll and the driving mechanism directly connected thereto. Fig. 3 is an enlarged section of a part of the spring-roll on the line 1* 1* of Fig. 4, showing the manner of connecting the coils which form the roll-periphery to the supporting-disks on the driving-rod. Fig. 4 is a transverse section on the line 1 1 of Fig. 3. Fig. 5 shows one of the connecting-keys separately. Fig. 6 shows in front elevation and Fig. 7 in end elevation our improved spring-roll arranged in connection with the usual gage-roll and a lower elastic-surface roll employed in leather-splitting machines. Fig. 8 is a view similar to Fig. 6, showing the spring-roll in longitudinal section and illustrating the manner in which the spirals yield downwardly.

Similar numbers and letters of reference indicate like parts.

Instead of making the roll of a single coil we form it of a number of coil sections or spirals, as A B A′ B′, &c., Fig. 8. These sections may be in practice about eighteen inches in length for a roll two inches in external diameter. In practice, also, we have used six such spirals in a roll one hundred and six inches long; but of course we do not limit ourselves to these particular dimensions. Each spiral is formed of wire, preferably of rectangular cross-section and having a substantially smooth exterior surface. The supporting central rod C is of rectangular cross-section and receives the end pieces D E and the intermediate supports F. Said end pieces and supports are shouldered to enter the ends of the spirals. They also slide freely on the rod C.

The end piece D, Fig. 1, has a recess which receives a spring, preferably in the form of a block G of rubber or other elastic material, and also the collar H, which is secured to the rod C by the set-screw I. The opposite end piece E has a recess which receives a similar rubber block J and a washer K. The extremity of rod C is here threaded to receive the nut L, by means of which the distance between the end pieces D E can be varied in order to increase or diminish the end pressure on the spirals. The end spirals are prevented from rotating on the end pieces by means of keys, one of which is shown at M. Each key enters a recess cut in the shouldered portion of the end piece and a slanting recess formed in the outer edge of the spiral. Each support F has at its edge a radial recess to receive the key N, Fig. 5. The upper edges of said key are inclined to enter inclined recesses in the ends of the spirals, as shown in Fig. 3.

The rod C is polygonal and here shown as square in cross-section. The openings in the supports F are parallelograms and wider in one dimension than said rod. Thus in Fig. 4 the opening Q has two sides extending beyond the corresponding sides of the rod C, so that between the remaining sides of said rod and the body of support F there are clearances *a a*. When the roll is in the position shown in Figs. 3 and 4, the body of the support bears directly down on the upper side of the rod C. The successive supports are to be placed on the rod C with the long sides of the opening Q in one support at right angles to the long sides of the opening Q in the next adjacent support or, in other words, alternately, as shown in Fig. 8, in which the

supports F have their body portions bearing directly on the rod C, while the supports F′ have their clearances *a* above and below said rod. When the spring-roll is placed in the machine, the spirals A B A′ B′, &c., rest directly on the roll R, Figs. 6, 7, and 8, which has an elastic or yielding surface, and above the spring-roll is the usual gage-roll S, between which gage-roll and the spring-roll R the hide to be split is drawn and presented to the knife. Now if for any cause intervening between the spring and gage roll, a portion of the spring-roll is forced away from the gage-roll said portion will be curved downwardly, and its convex under side will compress the yielding surface of the lower roll R. The longitudinal extent of this downwardly-curved portion will be limited by the two supports F, which at the time support the spirals interiorly, and the downward curving will be permitted by the clearance *a* of the support F′, which lies between these two. This is illustrated in Fig. 8. The spirals A′ B′ are here acted upon by any object, as T, between the gage-roll S and the spring-roll R, whereby the said spirals are pushed down, as shown, this being permitted by the clearance of the rod in support F, while the downwardly-curved portion instead of extending along the entire roll is limited to the distance between the interior supports F F.

The object is to enable the spring-roll to yield elastically, while at the same time sufficiently preventing a coincident yielding or bending of the internal rod C, and yet maintain such connection between the rod C and the spirals at every internal support F or F′ as will permit the rod at every support to impart its rotary movement to the spirals. In practice we find that with the openings in alternate supports adjusted at right angles, so that spirals immediately adjacent, as A′ B′, are supported at their outer ends and owing to the clearance in the intervening support F′ are free to yield downwardly at their inner or abutting ends, excellent results are obtained and that any bending of the rod C which may then occur is negligible.

In assembling the rod the end piece D is first put on the rod C and slid along to allow the parts G H to be placed in position. Then the end piece D is drawn back over said parts. The end spiral (marked B in Fig. 1) is then applied to the shoulder O of end piece D and secured by a key. (Not shown.) A support F, Fig. 1, is then placed on the rod and the key N inserted to connect said support to the end of said spiral. The next spiral A, Fig. 1, is then applied to the rod, so that its end recess will receive the already-placed key N, then another support with its opening Q at right angles to the similar opening in the already-placed support, and so on until the successive spirals are adjusted in position, as illustrated in Fig. 8. Lastly, the end piece E is applied, with its shoulder P entering the adjacent end spiral. The rubber block G and washer K are inserted and, lastly, the nut L applied to the threaded end of rod C. This nut being tightened draws all the parts together and regulates the end pressure on the spirals, as already stated. This roll can be driven by power applied to its own rod. This is indicated in Fig. 2. The pinion 2 is loose on stud 3, (dotted lines,) carried by bracket 4. Entering the pinion is a stud 5. Said stud is secured to a sleeve 6 integral with the pinion 2 by means of a key 7, (dotted lines.) The outer end of stud 5 is connected by a universal joint 8 to the end of a link 9. The opposite end of said link by a similar universal joint 10 is connected to a block 11, having a recess which receives the extremity of the rod C. It will be obvious that when the pinion 2 is rotated by any suitable means, as by another and engaging pinion, the spring-roll will be rotated on its longitudinal axis while resting upon the lower roll R.

We claim—

1. A spring-roll for leather-splitting machines formed of a succession of spirals having a substantially smooth exterior surface.

2. A spring-roll for leather-splitting machines formed of a succession of spirals of wire of rectangular cross-section, having a substantially smooth exterior surface.

3. In a spring-roll for leather-splitting machines, a central rod and a plurality of spirals having a substantially smooth exterior surface supported on said rod.

4. In a spring-roll for leather-splitting machines, a central rod, a succession of spirals having a substantially smooth exterior surface and supports for said spirals interposed between the same and received on said rod.

5. In a spring-roll for leather-splitting machines, a central rod, a succession of spirals having substantially smooth exterior surfaces, supports for said spirals interposed between the same and received on said rod, and means for varying pressure applied to the extremities of said spirals.

6. In a spring-roll for leather-splitting machines, a central rod, a succession of spirals thereon having substantially smooth exterior surfaces and means for preventing rotation of said spirals on said rod.

7. In a spring-roll for leather-splitting machines, a central rod, end pieces thereon, a succession of spirals having substantially smooth exterior surfaces disposed on said rod and between said end pieces and means for moving said end pieces to vary the distance between them.

8. In a spring-roll for leather-splitting machines, a central rod, end pieces thereon, a succession of spirals having substantially smooth exterior surfaces on said rod, supports freely movable along said rod and interposed between said spirals and receiving the extremities

thereof, and means for moving one of said end pieces to vary the distance between them.

9. In a spring-roll for leather-splitting machines, a central rod, supports thereon, a spiral on said rod having a substantially smooth exterior surface; the said spiral and supports being provided with recesses and keys entering said recesses.

10. In a spring-roll for leather-splitting machines, a central rod, end pieces thereon, a succession of spirals having substantially smooth exterior surfaces on said rod, supports on said rod interposed between said spirals and receiving the extremities thereof; the said spirals and supports being provided with recesses and keys entering said recesses.

11. In a spring-roll for leather-splitting machines, a central rod of polygonal cross-section, a spiral on said rod having a substantially smooth exterior surface, supports on said rod for said spiral, and means for connecting said spiral to said supports.

12. In a spring-roll for leather-splitting machines, a central rod, two end pieces freely sliding theron, a fixed stop between one end piece and the adjacent extremity of said rod—a second end piece, a nut on said rod beyond said end piece, and a plurality of spirals supported on said rod between said end pieces.

13. In a spring-roll for leather-splitting machines, a central rod, two end pieces freely sliding thereon, a fixed stop between one end piece and the adjacent extremity of said rod—a second end piece, a nut on said rod beyond said end piece, and springs interposed between said first end piece and fixed stop and between said second end piece and nut.

14. The combination in a leather-splitting machine of a spring-roll having an elastic surface formed of a succession of close-wound, hollow spirals placed end to end, a central shaft supporting said spirals, bearings for said shaft, and mechanism applied to said shaft for rotating said roll.

15. In a spring-roll for leather-splitting machines, a polygonal central rod, a spiral having a substantially smooth exterior surface, and supports for said spiral on said rod and an intermediate support for said spiral also on said rod; the said intermediate support having an opening receiving said rod to produce clearances on two opposite sides of said rod and to fit upon the remaining sides.

16. In a spring-roll for leather-splitting machines, a central polygonal rod, end pieces thereon, a succession of spirals having substantially smooth exterior surfaces disposed on said rod between said end pieces, and intermediate supports for said spirals also on said rod; the said intermediate supports having openings receiving said rod constructed to produce clearances on two opposite sides of said rod and to fit upon the remaining sides; the said supports being placed on said rod so that said clearances occur on alternate pairs of opposite sides.

17. In a spring-roll for leather-splitting machines, a central rectangular rod, end pieces thereon, a succession of spirals having substantially smooth exterior surfaces disposed on said rod between said end pieces and intermediate supports for said spirals on said rod and between said spirals; the said supports each having a rod-receiving opening of rectangular cross-section constructed to produce clearances on two opposite sides of said rod and to fit upon the remaining sides and the said supports being placed on said rod so that said clearances occur on alternate pairs of opposite sides.

18. The combination in a spring-roll for leather-splitting machines, of a roll formed of spirals, a central rod and a plurality of supports for said spirals on said rod; the said supports having rod-receiving openings constructed and arranged to permit a portion of the roll-surface lying between alternate supports to be deflected.

19. The combination in a spring-roll for leather-splitting machines, of a roll formed of spirals, a central rod and supports for said spirals on said rod; the said supports having rod-receiving openings constructed and arranged to permit a portion of the roll-surface to be deflected.

20. The combination in a spring-roll for leather-splitting machines, of a roll formed of a succession of spirals, a central rod, supports on said rod for said spirals and a roll disposed below said spring-roll in contact therewith and having a yielding elastic surface; the said supports having openings receiving said rod constructed and arranged to permit said spirals between alternate supports to be deflected downwardly and into the elastic surface of said lower roll.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM D. QUIGLEY.
JOSEPH H. GAY.

Witnesses:
WM. H. SIEGMAN,
I. A. VAN WART.